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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,522	12/14/2001	Cary A. Kipke	56963US002	9096

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EXAMINER	
SODERQUIST, ARLEN	

ART UNIT	PAPER NUMBER
1743	

DATE MAILED: 10/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,522	KIPKE ET AL.	
	Examiner	Art Unit	
	Arlen Soderquist	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-58* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2-3* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1. Claims 1-58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the claims it is not clear if there is any structural definition that corresponds to the respective volumes claimed or if an arbitrary choice of where one volume ends and the next begins is all that is required. For examination purposes the latter scope is what is being used.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4,14-18 and 28-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Baker (US 5,716,584). In the patent Baker teaches a device for the synthesis of compounds in an array and method for the simultaneous production of chemical compounds in an array which is capable of providing a very broad range of reaction environments including reaction temperatures of –40°C. to 150°C, reflux, condensation, and a selective gas environment. The invention also allows the addition of several reagents during the course of the production process. The device is comprised of a number of different block sections which are fastened together to provide the required reaction environment. The device of the invention is referred to as an array synthesis block and is made up of a number of smaller subunits in combination. The various subunits are assembled in a stack depending upon the type of reaction environment required by the desired synthesis. The device includes a retaining block section for holding reaction vessels. The preferred form of the retaining block section also incorporates gas flow channeling for providing a selective gas atmosphere. Usually nitrogen, argon, or some other inert gas is used in order to carry out reactions to the exclusion of oxygen. A temperature control block section is combined with the retaining block section in order to heat or cool the reaction vessels. Heating or cooling fluid is circulated through the temperature control block section. A reflux control block section required for certain synthesis is combined with the temperature control block section and

the retaining block section in a stack in order to provide reflux and condensation during reaction. Cooling gas or liquid is circulated through the reflux control block section. Alternatively, a portion of the reflux chamber is filled with a solid coolant such as ice or solid CO_2. These block sections are fastened together in a stack to form the array synthesis block. Fastening is accomplished by any number of suitable methods such as bolts passing through registering holes in the multiple block sections, clips holding the multiple block sections together, or an exterior bracket that clamps the block sections together as an assembled synthesis block. Once the individual sections of the synthesis block are fastened together the entire unit can be sonicated or fastened onto a rotational shaker.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 7-10, 21-24, 30-33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker as applied to claims 1 and 14 above. Baker does not teach the relative positioning of gas inlets and gas vents, the use of a plurality of inlets and vents or a plurality of modules. However the Courts have held that the reversal of parts is not a matter of invention, the rearrangement of parts without changing their functions is within the skill in the routineer in the art, and mere duplication of parts without any new and unexpected results is within the skill of the routineer in the art (see *In re Gazda*, 104 USPQ 400 (CCPA 1955), *In re Japikse*, 86 USPQ 70 (CCPA 1950), *In re Harza*, 124 USPQ 378 (CCPA 1960) and *Sjolund v. Musland*, 6 USPQ 2d 2020 (Fed. Cir. 1988)).

6. Claims 11-13, 25-27 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker as applied to claims 1, 14 and 32 above, and further in view of Mohan (US 5,888,830). Baker does not teach a drain to the reaction tubes, a membrane in contact with the sample or a valve.

In the patent Mohan teaches a device in which multiple chemical reactions are performed in a plurality of reaction vessels mounted in inlets in a manifold valve block. The manifold valve block is connected to a channel block which is utilized in conjunction with a solvent delivery system as part of the reaction cycle. The solvent fluid is drained from the reaction vessels when valves in the manifold valve block are opened while applying a vacuum thereto. Optionally, a thermal block may be utilized in conjunction with the manifold valve block and the channel block to facilitate the reaction. Upon completion of the reactant cycle, the manifold valve block is disconnected from the channel block and connected to a cleavage block assembly which contains vials for collecting reaction products. The cleavage product is drained from the reaction vessels through the manifold valve block into the vials upon opening the valves in the manifold valve block and applying a vacuum to the channel block. The device is substantially similar to the Baker device and includes a reaction station system (10) having an 8X12 array or matrix of reaction stations arranged in twelve columns and eight rows with each reaction station associated with a single reaction vessel (12) having a syringe tip (13). Each of the reaction vessels is of a generally known configuration and includes a filter (12a, membrane) at the syringe tip above which is a frit (12b) that is configured as solid support beads upon which chemical templates are attached via appropriate linkers. The filter normally holds liquids such as solvents and reaction products in the reaction vessel. The manifold valve block (30) is in the form of a first rectangular section with the rows of valve operators (32) therein aligned with separate rows of valves for each reaction vessel so that the reaction vessels can be closed to retain solvents therein during the reaction stage of the process. The manifold valve block also has a plurality of inlet ports (23) in the top surface thereof, each of which receives the syringe tip of a reaction vessel. Beneath manifold block is a channel block (34) in the form of a second rectangular section which has channels therein for draining fluid out of the system via a drainage

system (35) and combines with the manifold valve block to comprise the reaction grid (14). The channel block which forms the second rectangular section has a top surface with a plurality of inlet portion extensions. The drainage system includes an exhaust line (36) connected to a waste vessel (38) and a vacuum pump which draws fluid from the reaction vessels after the valves in the manifold valve block, operated by the valve operators, have been opened. A controller (27) which operates the washing system (21), may also be used to operate the drainage system.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Mohan reaction vessel and its fluid processing system of valves and membranes into the Baker device because of the ability to perform synthesis according that taught by Mohan.

7. Claims 1-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friswell (US 5,100,623) in view of Ball (US 5,679,580) and Mohan as explained above. In the patent Frizwell teaches a laboratory evaporation apparatus for use in isolating solids from liquids by evaporating the liquid, including a vessel for receiving a composition of liquid and solid substances; a gas supply for supplying a drying gas; a gas line for directing the drying gas from the gas supply to the vessel; a liquid supply for supplying a solvent capable of dissolving the solid substance; and a liquid line for directing the solvent from the liquid supply to the vessel. Also included is a sensing means for sensing conditions of evaporation within the vessel and an automatic control system adapted to sequentially initiate a flow of drying gas to the vessel, initiate a flow of solvent to the vessel in response to sensing of a given evaporation condition by the sensing means, interrupt the flow of solvent to the vessel after a certain quantity of solvent has been received thereby, and interrupt the flow of drying gas to the vessel in response to sensing of a particular evaporation condition by the sensing means. The apparatus automatically produces an evaporation cycle, a solvent reconstitution cycle, and a re-evaporation cycle thereby significantly reducing previously required costly manual procedures. An evaporator (11) is encompassed in a housing including a front housing portion (12) and a rear housing portion (13). In the front portion is a hollow basin (14) for accommodating a temperature controllable water bath, a support rack (15)

mounted in the basin to retain a plurality of vessels (16) having openings at their upper ends for receiving liquid and solid compositions. Also in the front housing portion is a vent (17) that communicates with an exhaust port in the rear housing portion. A tray-shaped, transparent cover (18) is pivotally mounted on the rear housing portion and can be pivoted from an open position as shown in figure 1 to a closed position completely covering the basin and the vent. Mounted in a rear portion of the cover is a bracket assembly (19) that supports a combined gas and liquid supply line assembly (21) including a plurality of elongated nozzles (22) rigidly supported by the bracket 19. Upon closure of the cover, each of the nozzles is arranged to enter the open top of a different one of the vessels in the manner shown in figure 2. An electrical control system (see figure 4) is within the rear housing portion and automatically controls a predetermined evaporation process in each of the vessels. A vessel is depicted in figure 2 along with the sensing system (36) for monitoring completion of an evaporation cycle within the vessel. Each vessel includes a tubular upper portion having a diameter D and a length L and a lower portion having a diameter d and a length 1 that are generally smaller than the upper portion. Also illustrated in the figure is one of the nozzles positioned at the top of the upper tube portion to produce fluid discharge in a helical path (33) along the inner wall of the upper vessel portion downwardly at an angle of from about 30 to 45 degrees from horizontal. Because of the helical flow, a vortexing action occurs in the liquid in the vessel producing sample homogeneity and continuous rinsing of the vessels inner wall. After reaching the bottom of the vessel, the vapor-laden drying gas exits via an unobstructed path (35) up the center portion of the vessel and is removed by an exhaust fan through the vent. Friswell does not teach the gas inlet in a sidewall of the device being directed tangent to a curve of the sidewall, the relative positioning of gas inlets and gas vents, the use of a plurality of inlets and vents, a plurality of modules, a drain to the vessels, a membrane in contact with the sample or a valve.

In the patent Ball teaches a rapid evaporation method for analysis in which dissolved components of a liquid sample are recovered for analysis by delivering the sample to a concentrator comprising a cylindrical receptacle into which an uncontaminated gas, such as air, is introduced in a direction tangentially of the cylindrical

wall. The gas is under sufficient pressure to effect swirling of the gas and liquid sample and atomization of the sample to rapidly evaporate the same and cause a residue containing the dissolved components to be deposited on the interior surface of the wall. A reconstituting solvent is then admitted to the receptacle to dissolve the residue and provide a reconstituted, concentrated sample for analysis. If desired, the sample may be concentrated to a given volume rather than to complete dryness. A dilute liquid substance may be processed by rapid evaporation to provide a final product of desired concentration. Column 1 teaches that prior systems for sample concentration include evaporators which typically operate in a batch mode and agitate and/or heat the sample to increase the speed of evaporation. This can be a period of several hours or even a day to reduce the fluid sample volume to the desired concentration, severely limiting the rate at which laboratory procedures can be concluded. The invention described is an improved process for evaporating liquid samples that will enable analytical laboratories to meet requirements for rapid sample turnaround and provide the ability to process large volume samples on a continuous as well as a batch basis. The device is an upright cylindrical receptacle (10) constructed of Teflon, glass or stainless steel with a relatively thin, cylindrical wall (12) having an elongated, vertical inlet slit (14) therein. A pair of closely spaced, outwardly projecting inlet ports (22,24) communicate with the interior of the cylindrical chamber defined by the wall, and are disposed in closely spaced relationship to the base plate. An outlet port (26) is located at the center of the base plate (16), the latter sealing the bottom of the receptacle and providing an upper surface (28) which has an inverted conical configuration presenting approximately at twenty degree slope from the circumferential edge of the base plate to the outlet port. A pressure sensor port (30) also communicates with the interior of the cylindrical chamber and is disposed above inlet slit adjacent the upper end (20) of the receptacle. A tube or conduit (32) communicates with a cap (34) which fits over and is sealed to the upper end (20) of the receptacle, the conduit extending to the intake of a vacuum pump. An input liquid supply line (36) communicates with one inlet port through a valve (38), and a solvent supply line (40) communicates with the other inlet port via a valve (42). An outlet line (44) extends from the outlet port and is controlled by a valve (46). One operational mode is the

processing of a liquid sample to recover components for an analytical laboratory procedure to identify the dissolved components. In this mode, the liquid sample is supplied to the cylindrical chamber within the receptacle by opening the valve (38). With the vacuum pump in operation, a negative pressure at the top of the receptacle draws ambient air or a controlled atmosphere, such as nitrogen, into the chamber through the Venturi-like inlet slit in a tangential direction where swirls around the inside surface of the cylindrical wall as illustrated by the arrow 48 in figure 3. The function of the incoming air or other gas is to effect rapid evaporation of the sample and cause a residue containing such components to be deposited on the interior surface of the wall. This is accomplished by maintaining the incoming air at a sufficiently high pressure to effect atomization of the sample into fine droplets so that evaporation will occur at a much higher rate than it would if the liquid were simply contacted by the air and swirled in the chamber. As the air spirals upwardly (arrow 50) to the vacuum conduit, the liquid advances to approximately one-half of the height of the receptacle. The applied vacuum is limited to a level which will cause the atomization necessary for rapid evaporation, but not suck the liquid out of the receptacle and is maintained until evaporation is complete. This leaves the dissolved components deposited on the interior surface of the wall for reconstituting by opening a valve to admit a reconstituting solvent and swirling briefly to dissolve the sample residue from the wall surface. The vacuum is then removed and the valve is opened to drain the reconstituted sample from the receptacle.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sidewall gas inlet as taught by Ball into the device and method of Friswell because of the similarity in the method of operation and to obtain the rapid evaporation taught by Ball. The Courts have held that the reversal of parts is not a matter of invention, the rearrangement of parts without changing their functions is within the skill in the routineer in the art, and mere duplication of parts without any new and unexpected results is within the skill of the routineer in the art (see *In re Gazda*, 104 USPQ 400 (CCPA 1955), *In re Japikse*, 86 USPQ 70 (CCPA 1950), *In re Harza*, 124 USPQ 378 (CCPA 1960) and *Sjolund v. Musland*, 6 USPQ 2d 2020 (Fed. Cir. 1988)). It would have been obvious to one of ordinary skill in the art at the time the invention was made to

incorporate the Mohan reaction vessel and its fluid processing system of valves and membranes or the ability to remove the sample from the vessel using a drain and valve as taught by Ball into the Friswell device and method because of the ability to add and remove liquids in a non batch manner according that taught by ball and Mohan.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional art relates to apparatus and method for drying ro evaporating fluids to concentrate components therein.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose telephone number is (703) 308-3989. The examiner's schedule is variable between the hours of about 5:30 AM to about 5:00 PM on Monday through Thursday and alternate Fridays.

For communication by fax to the organization where this application or proceeding is assigned, (703) 305-7719 may be used for official, unofficial or draft papers. When using this number a call to alert the examiner would be appreciated. Numbers for faxing official papers are 703-872-9310 (before finals), 703-872-9311 (after-final), 703-305-7718, 703-305-5408 and 703-305-5433. The above fax numbers will generally allow the papers to be forwarded to the examiner in a timely manner.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Arlen Soderquist

October 21, 2003

ARLEN SODERQUIST
PRIMARY EXAMINER

A copy of the Search Report from a foreign counterpart application is enclosed.

It is believed that no fee is due; however, in the event a fee is required, please charge the fee to Deposit Account No. 13-3723.

Respectfully submitted,

3/19/2003
Date

By: Christopher D. Gram
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